Advanced Distributed Learning

A Presentation to DoD's Government and Industry Partners

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ADL

- **Collaboration**
- **Learning Technologies**
- **Shared Problems**
- **Shared Solutions**

“LEARNING”

“Learning” encompasses:

- **Training**
- **Education**
- **Performance Mentoring**

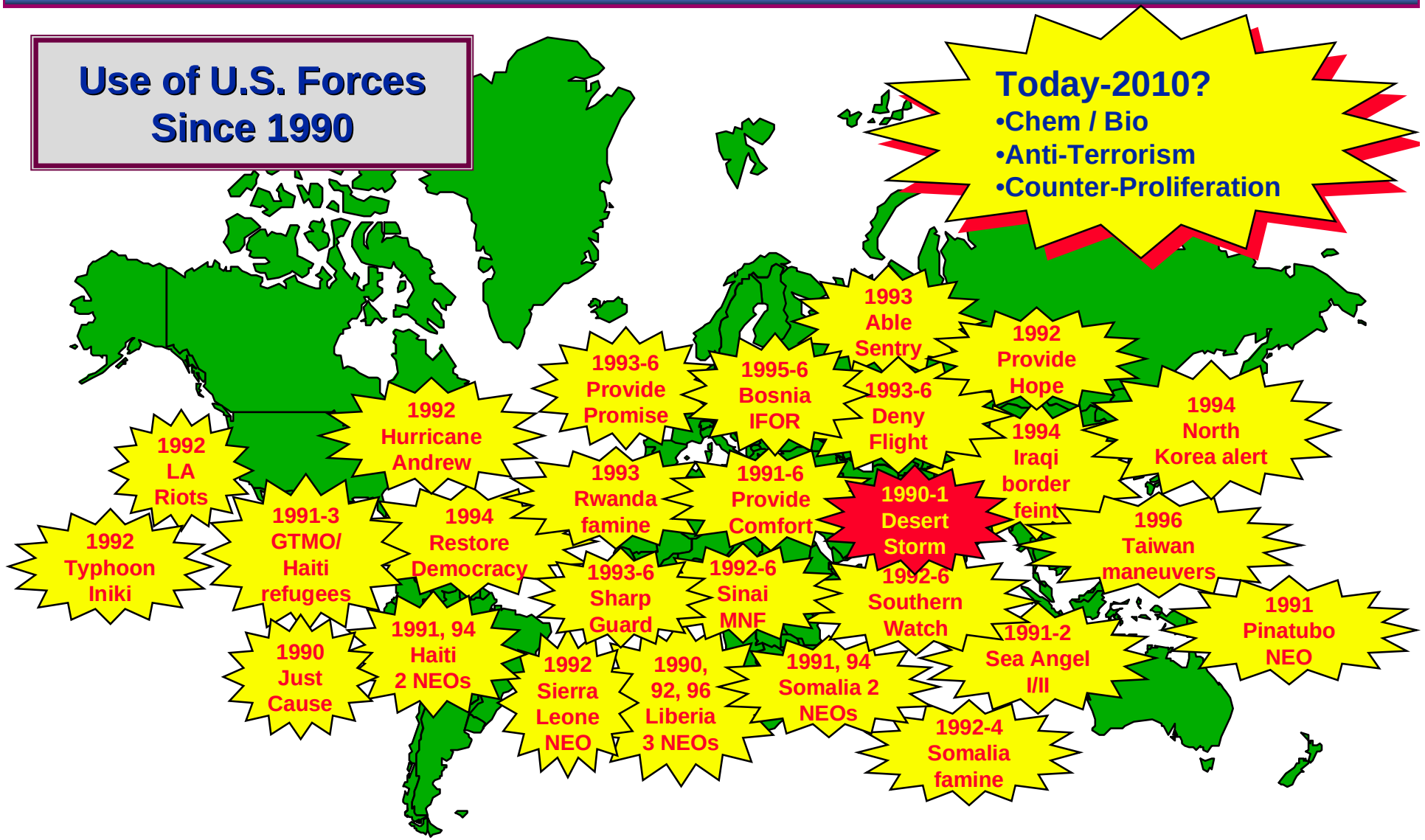
ADL Vision

- **Quality Education and Training**
- **Tailored to Needs**
- **Delivered Cost Effectively**
- **Anytime**
- **Anywhere**

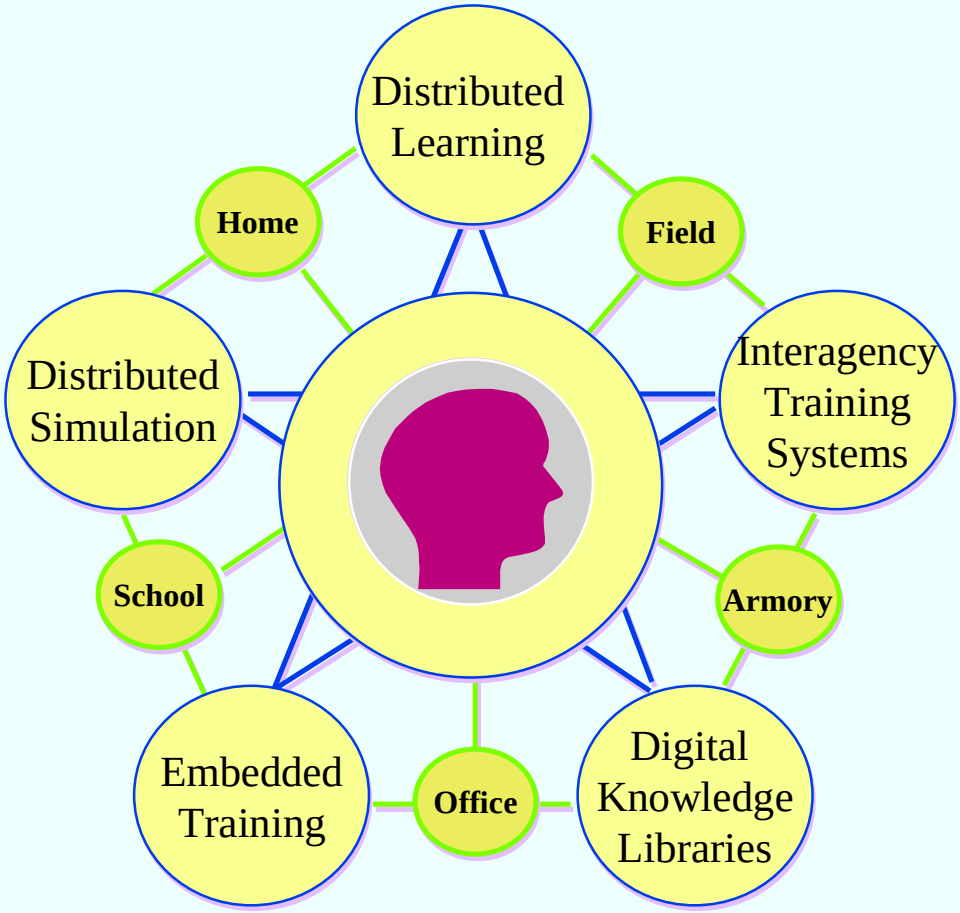
Builds upon the success of the Defense Modeling and Simulation Initiative

Trained and Ready for What?

Future Missions Like the Recent Past -- and More



ADL Perspective



ADL Strategy

Use learning technologies to modernize DoD training

- Exploit existing network-based technologies
- Create platform neutral, reusable courseware and content to lower costs
- Promote widespread collaboration to satisfy common needs
- Enhance performance with emerging and next-generation learning technologies
- Develop common framework that drives COTS product cycle
- Design the "computer managed" learning framework
- Establish a coordinated implementation process

Key ADL Characteristics

Accessibility: the ability to access instructional components from one remote location and deliver them to many other locations

Interoperability: the ability to use instructional components developed in one location, with one set of tools or platform, in another location, with a different set of tools or platform

Durability: the ability to operate instructional components when base technology changes, without redesign or recoding

Reusability: the ability to incorporate instructional components into multiple applications

Affordability: the ability to significantly increase learning effectiveness while reducing time and costs

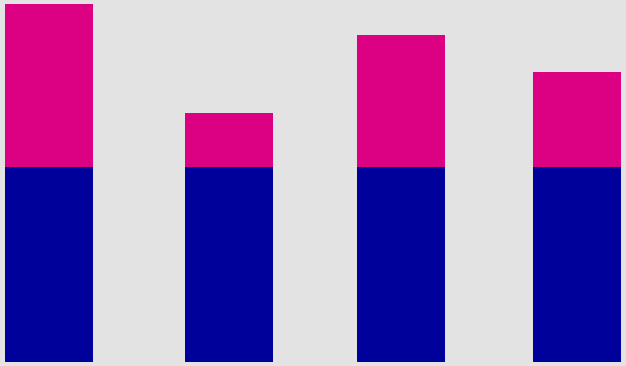
Common Open Technical Architecture and "Object Oriented" Software Are Keys to Reuse

Simulation Software Components

Common Software (utilities/services consistent across applications)

Unique Software (objects tailored to particular use)

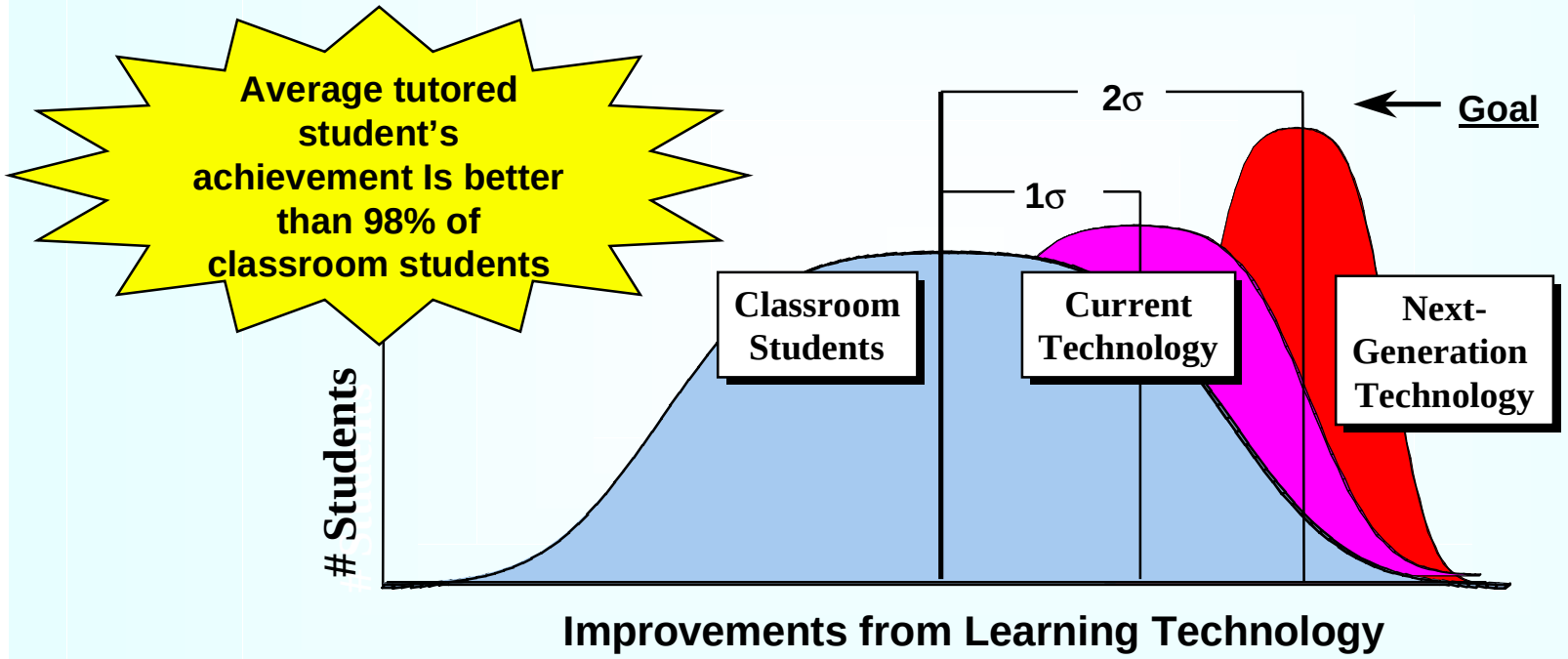
The Old Way: Stove-piped by Service, Mission, Location



The New Way: Shared Core, Re-Used Applications

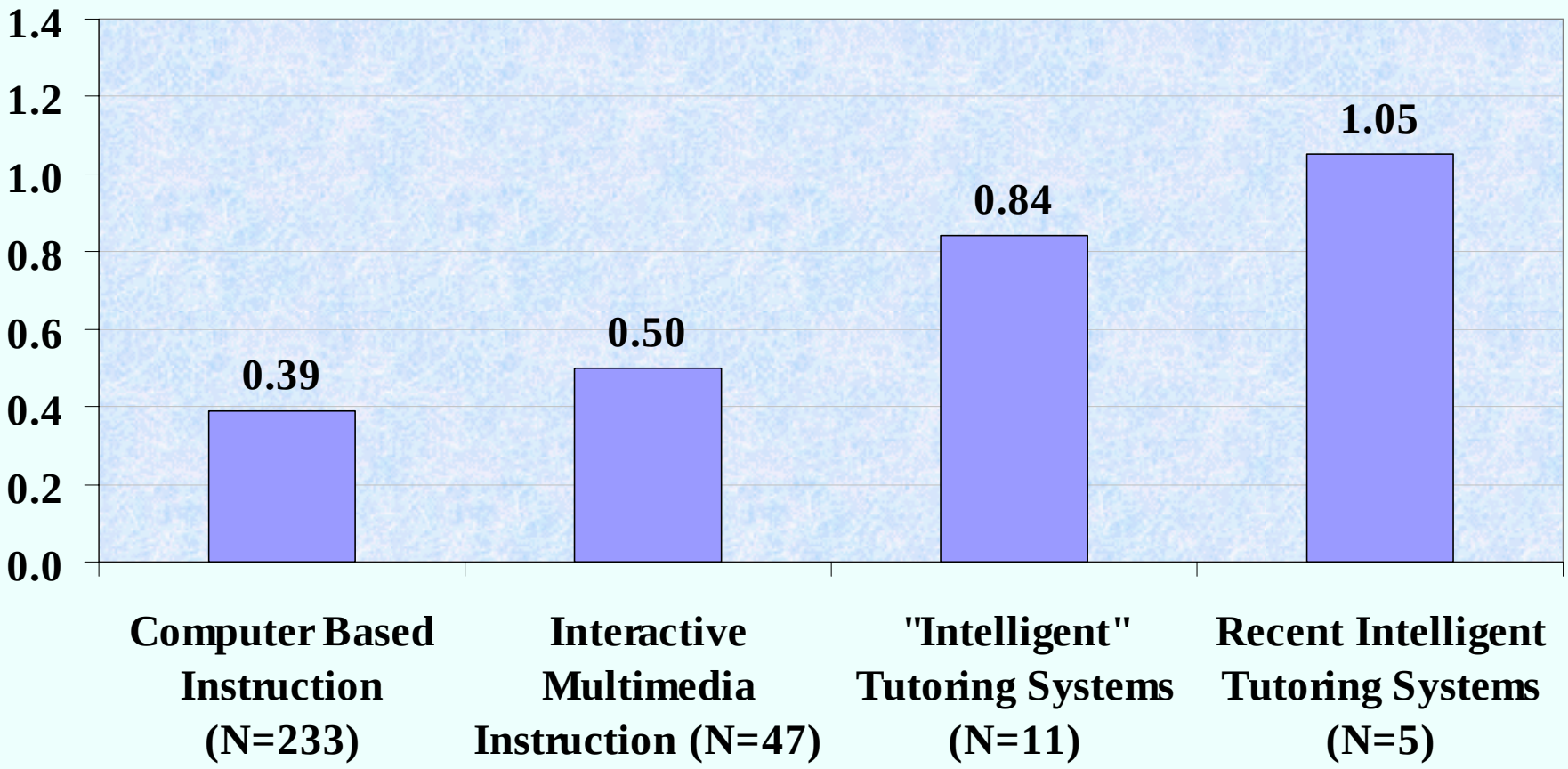
Next Generation of Learning Technology Offers Potential for Even Greater Efficiency

Studies suggest that Tutor Learning Achievement Is Better than Classroom Achievement by 2 Standard Deviations



Adapted From: Bloom, B.S. The Two-Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring. Educational Researcher. 13,4-16 (1984)

Some Effect Sizes for Technology-Based Instruction
(Standard Deviations)



Classroom and Tutorial Interactivity

- **Average number of questions asked by any student during a classroom hour -- 0.11**
- **Average number of questions asked by a student during a tutorial hour -- 21.1 (Research methods); 32.2 (Algebra)**

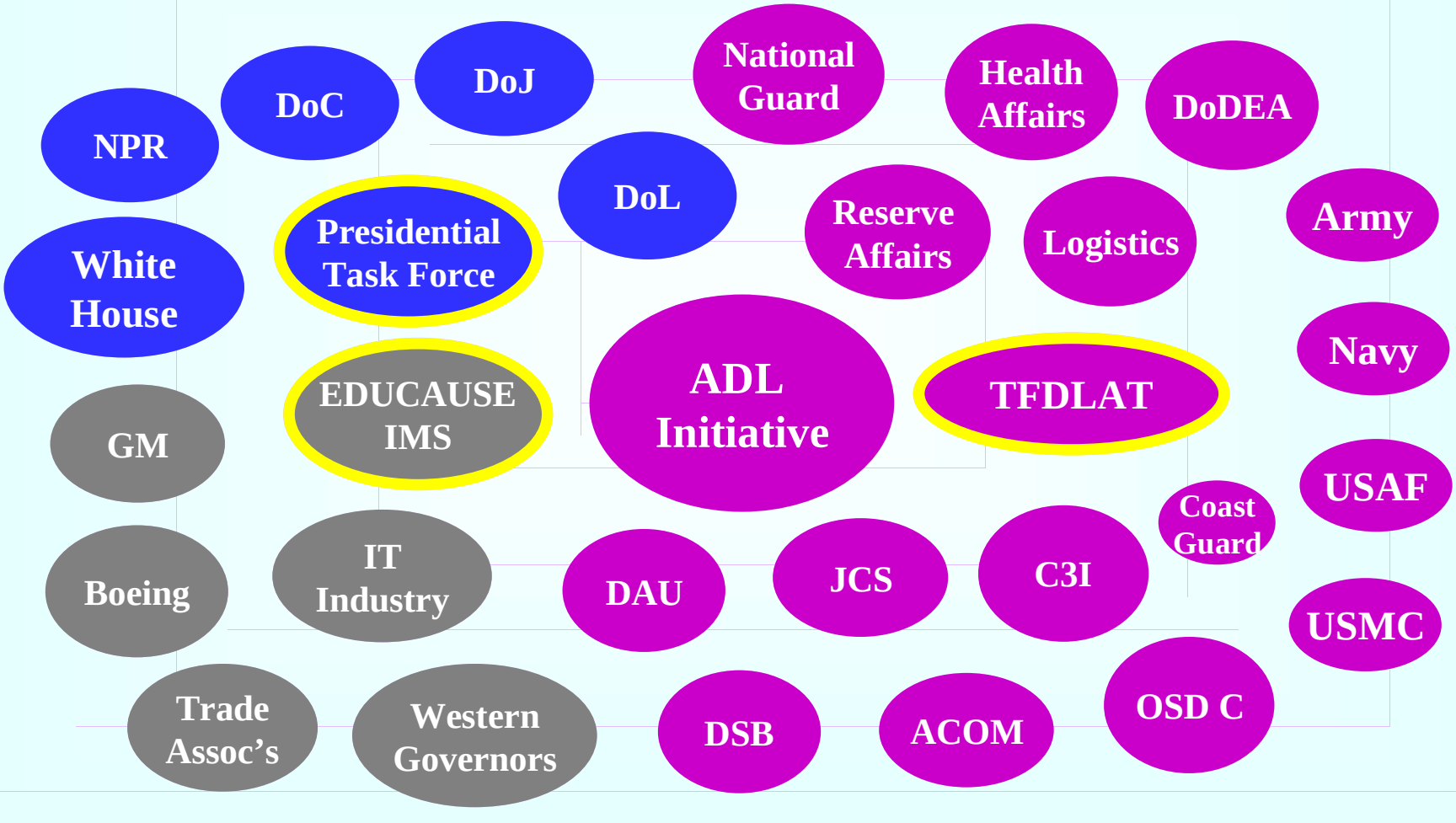
Directives and Activities

Develop a strategy and master plans for using learning technologies on a broad scale

- **QDR**
- **President's Executive Order / FTTI**
- **Deputy Secretary's Direction**
- **Congressional Reports**
  - **HASC**
  - **SASC**
- **DSB TF on Military Training and Education**

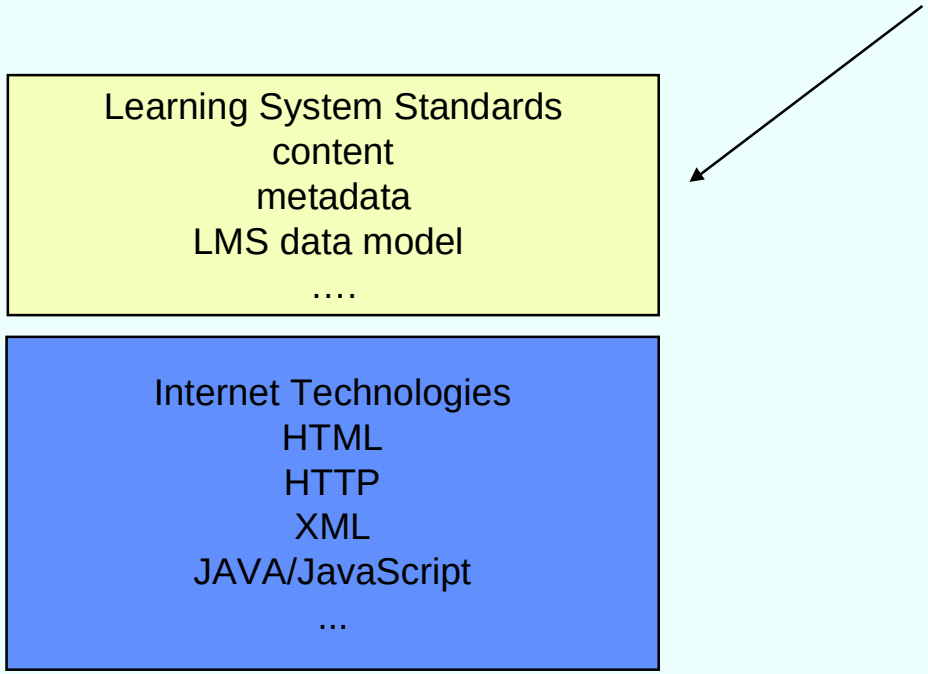
Ongoing ADL Activities

Opportunities for DoD to leverage resources within the Department and across the Public and Private Sectors



ADL Standards Focus

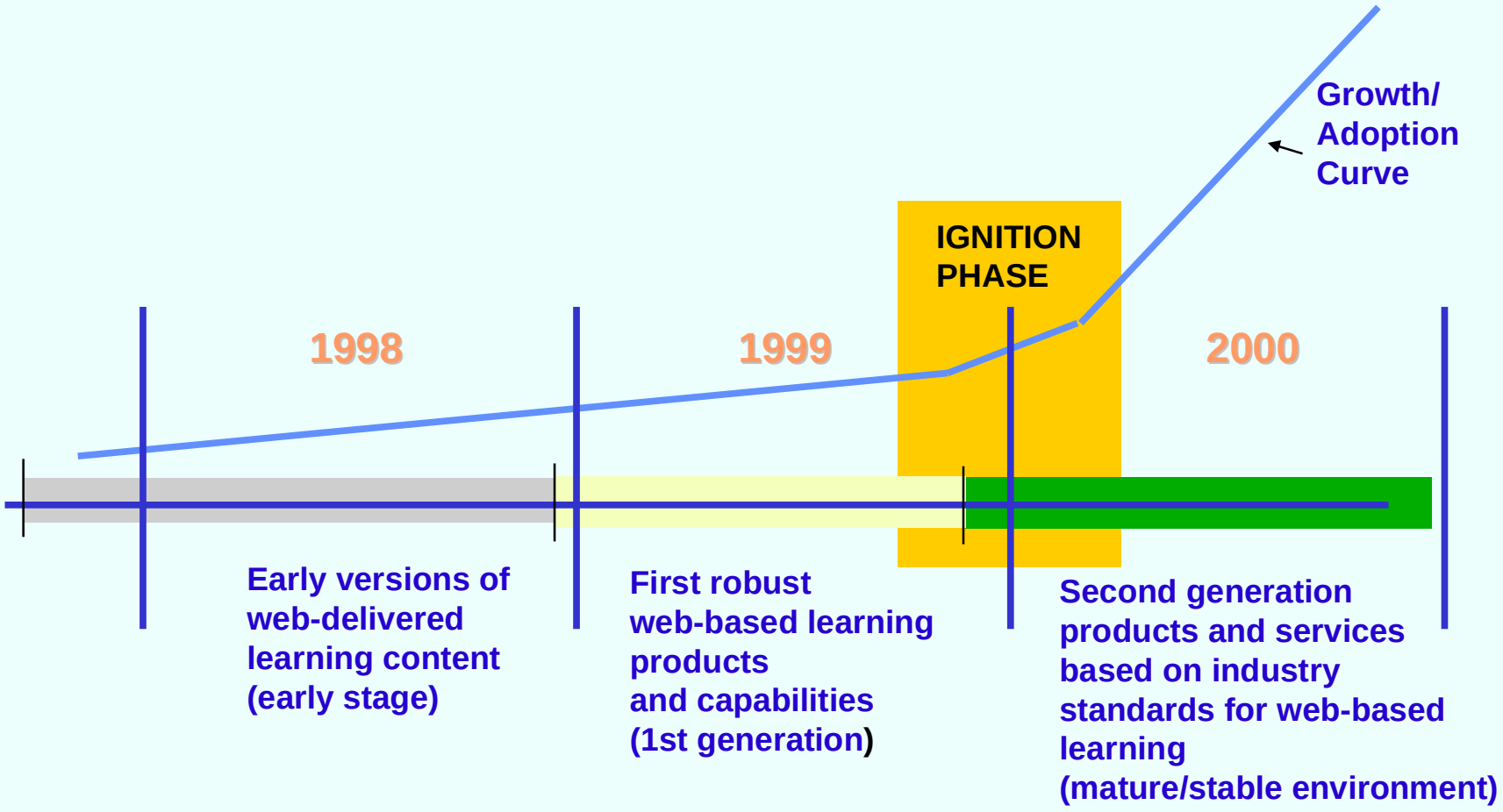
ADL is focusing on web-based learning system standards



But not Internet standards

(others are doing that)

Evolution of Web-based Learning Technologies



ADL Approach

- Examine military training learning models
- Develop a common “Shareable Courseware Object Reference Model” (SCOM)
- Map learning models to SCO reference model (to determine standards requirements)
- Submit requirements to appropriate groups

SCO Terms

Shareable Courseware Object

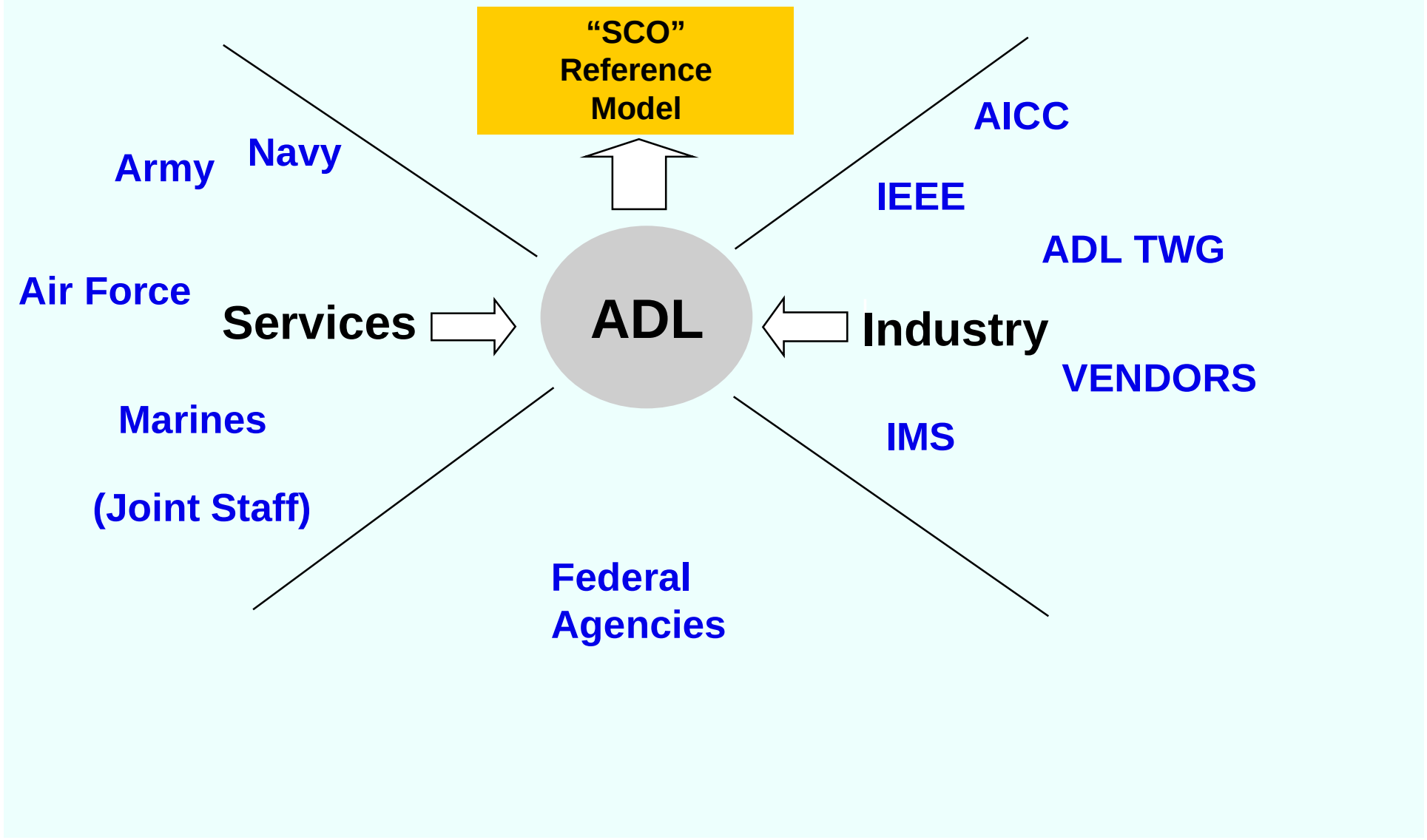
Reference Model

A software model that defines the interrelationship of course components, data models, and protocols such that courseware "objects" are shareable across systems that conform with the same model.

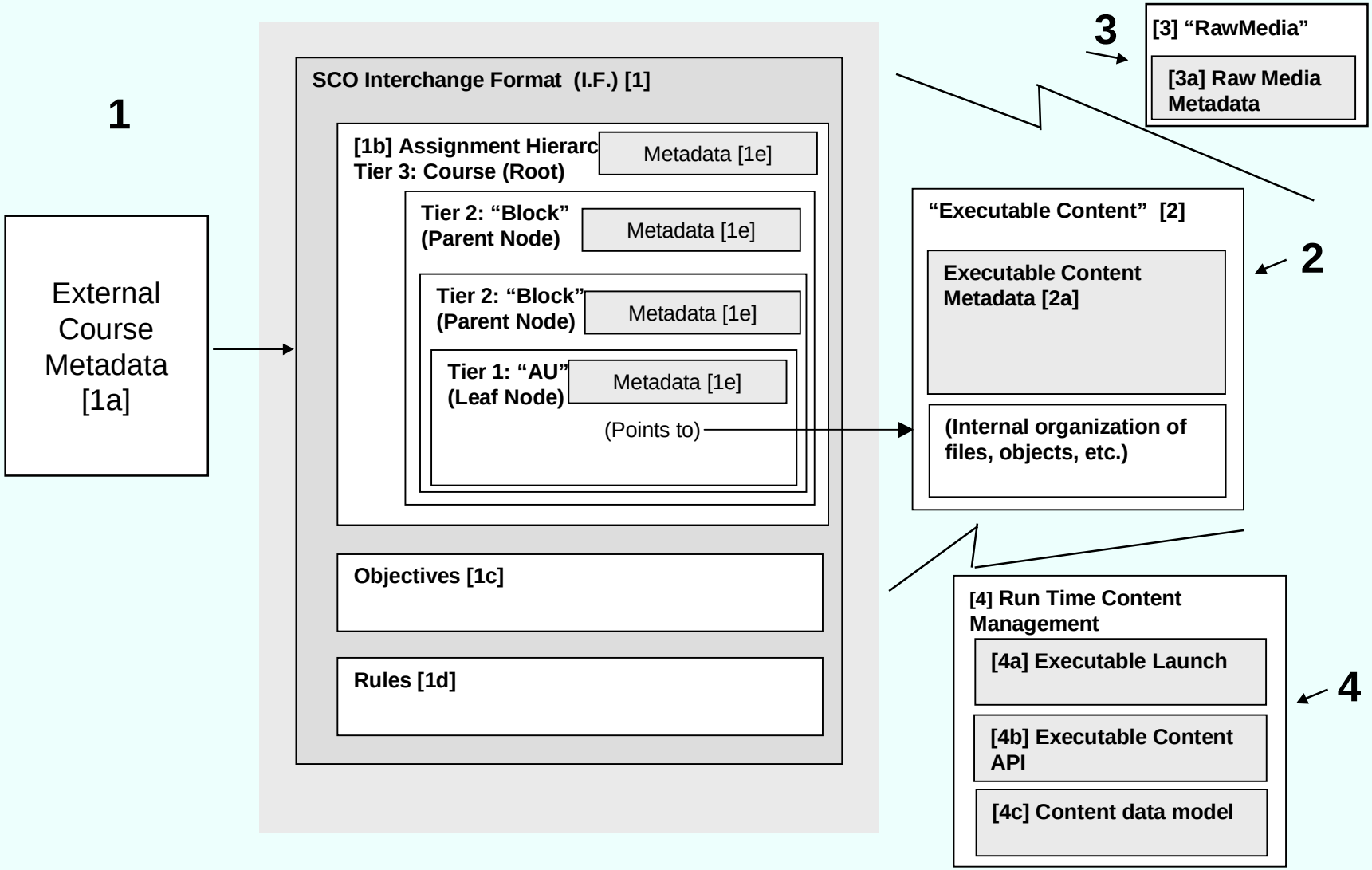
Standards Efforts

- IEEE 1484 (meeting June 10, 99 with Chair)
  - *de jure* standards body
- IMS
  - Closer to “consortium” model
- AICC
  - Airline industry-based
- Macromedia/Oracle/Netg/Asymetrix
  - *de facto* standards
- ADL Technical Work Group
  - Catalyst
- President’s Federal Training Technology Task Force
  - Lead agency with NIST for Standards Focus Group

ADL Process


"SCO"
Reference
Model
Army
Navy
Air Force
Services
Marines
(Joint Staff)
ADL
Federal
Agencies
AICC
IEEE
ADL TWG
Industry
VENDORS
IMS

SCO-RM (0.5.2)


1
External Course Metadata [1a]
SCO Interchange Format (I.F.) [1]
[1b] Assignment Hierarc
Tier 3: Course (Root)
Metadata [1e]
Tier 2: "Block" (Parent Node)
Metadata [1e]
Tier 2: "Block" (Parent Node)
Metadata [1e]
Tier 1: "AU" (Leaf Node)
Metadata [1e]
(Points to)
Objectives [1c]
Rules [1d]
3
[3] "RawMedia"
[3a] Raw Media Metadata
"Executable Content" [2]
Executable Content Metadata [2a]
(Internal organization of files, objects, etc.)
2
[4] Run Time Content Management
[4a] Executable Launch
[4b] Executable Content API
[4c] Content data model
4

Summary of ADL Prototypes

- Performance Mentoring Example: Repair and Maintenance / GM
  - Objective: Apply GM methodology for training mentoring on demand
  - Status: DUSD(L) providing "Dual Use" incentives - multiple proposals
- On-line School Example: DAU's ADL Prototype
  - Objective: Provide equal or better education opportunities to a wider audience
  - Status: Course delivery and management system with 5 courses on line today and another 14 courses in FY 99
- Joint Training Example: JCS ADL Prototype "DOCNET"
  - Objective: Provide high quality doctrine education to the Total Force, anytime, anywhere
  - Status: Initial Prototype on the web - 3 more modules planned
- Interagency Training Example: DoJ - DoD WMD
  - Objective: Increase Readiness to respond to WMD situations
  - Status: Areas of common interest being discussed

Where we are headed ?

- ADL
  - Vision
  - Strategy
  - Implementation Plan
- Federal Training Technology Initiative
  - Uses ADL as a model
  - Develop technical standards

Benefits of ADL

Potential to significantly reduce costs by up to 30% while satisfying education and training requirements

- **Makes "learning" available to Total Force**
- **Enables just-in-time, just-enough, performance aiding.**
- **Leverages private-sector intellectual and financial investments: architecture, industry standards, courseware, etc.**
- **Creates an "open forum" for broad public and private collaboration: among DOD, federal agencies, technology suppliers, private businesses, national workforce, etc.**

Bottom Lines

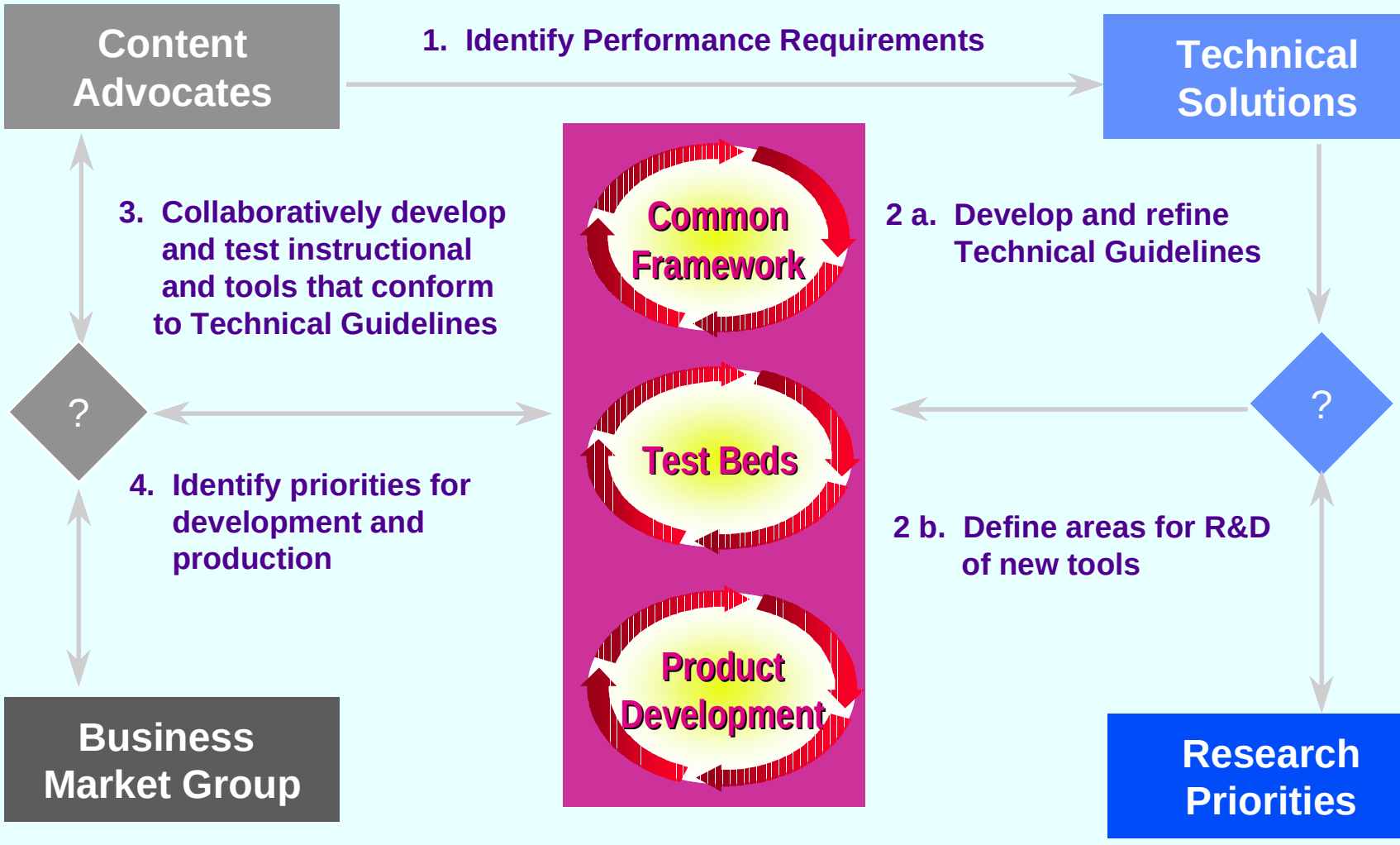
DoD must:

- Fundamentally reengineer how it does business to educate and train effectively in tomorrow's knowledge-based environment
- Provide incentives for change
- Collaborate across DoD as well as with the public and private sectors
- Develop common architectures that will allow it to take advantage of rapidly changing technology
- Experiment

www.adlnet.org

Backup Charts

ADL Collaboratory Concept



Projected ADL Time Table

- **Build consensus (Q1 99 - under way)**
- **Issue draft ADL SCO Model (June 30, 1999)**
- **Refine SCO specifications with industry DoD, and government communities (Q2/3 1999)**
- **Release Version 1 ADL SCO specifications (Sept. 1999)**
- **Industry implementation/adoption (Q3/Q4 1999)**

Some Terms

- **Distance Learning: Structured learning that takes place when the instructor is not physically present**

- **Distributed Learning: Structured learning that takes place anytime, anywhere it is needed or desired**

Some Example ADL Technologies

- Computer-Managed Instruction (CMI)
- Computer-Based Instruction (CBT)
- Interactive Multimedia Instruction (IMI)
- Intelligent Tutoring Systems (ITS)
- Networked Tutorial Simulation (NTS)
- Web-Based Training (WBT)